Raymond Weaver

DANTE

QUAESTIO DE AQUA ET TERRA

EDITED AND TRANSLATED

BY

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PREFACE

THE claim of the *Quaestio de Aqua et Terra* to be reckoned a genuine work of Dante has during the last ten years been actively debated, and may now be considered established. Dr. Moore's article in the second series of his Studies in Dante (1899) was the first attempt to reopen the question and to deal adequately with the objections which had so long been considered fatal to the genuineness of the work. With the appearance of that article, the controversy, which had slept for many years, became again a subject of interest among scholars. The most serious antagonist has been Signor Boffito, who in his two papers, published in the Transactions of the Accademia Reale of Turin in 1902 and 1903, has put the objections to the treatise with great ability : but those who have followed the controversy, and the counter-arguments urged by Signor Angelitti, of Palermo, Signor Russo, and Signor Biagi, will probably consider that he has failed to make out his case.

One important result of the revived interest in the subject has been the production of a photographic facsimile of the Editio Princeps of 1508, the only authority for the treatise. This, as Signor Biagi has shown, makes it impossible to suppose that Fra Moncetti, the editor, could have been the author of the work. The difference between the style and vocabulary of his own writings and the style of the *Quaestio* is conclusive. Nothing could be more unlike Moncetti's verbose and florid sentence than the austere and direct language of the treatise.

In the following translation I have endeavoured to give the correct equivalent of the logical terms used, which in many cases is not to be found in a mere repetition of the Latin words.

C. L. S.

OXFORD:
October, 1909.

NOTE.—E in the *apparatus criticus* indicates the *editio princeps* of 1508.

QUAESTIO
DE AQUA ET TERRA

QUAESTIO
DE AQUA ET TERRA

Quaestio aurea ac perutilis edita per Dantem Alagherium poetam Florentinum clarissimum de natura duorum elementorum aquae et terrae diserentem.

UNIVERSIS et singulis praesentes litteras inspecturis, Dantes Alagherii de Florentia, inter vere philosophantes minimus, in Eo salutem, qui est principium veritatis et lumen.

§ 1. Manifestum sit omnibus vobis quod, existente me Mantuae, quaestio quaedam exorta est, quae dilatata multotiens, ad apparentiam magis quam ad veritatem, indeterminata restabat. Unde quum in amore veritatis e pueritia mea continue sim nutritus, non sustinui quaestionem praefatam linquere indiscussam; sed placuit de ipsa verum ostendere, nec non argu-

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l. 13. E *dilatrata.* l. 15. E *& pueritia.*

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l. 13. *dilatata*: cf. *De Mon.* III. viii. 39 'quantum sua distributio dilatetur'.

A DISSERTATION CONCERNING WATER AND EARTH

A precious and most profitable dissertation set forth by Dante Alighieri, the celebrated Florentine poet, dealing with the nature of the two elements of water and earth.

To all and singular, who this present letter shall see, Dante Alighieri of Florence, the least of all true students of philosophy, greeting in the name of Him, who is the source and light of truth.

§ 1. Be it known to you all that while I was at Mantua, there arose a certain question, which after being many times debated on, yet rather for display than for the discovery of the truth, was left undetermined. So it came about, that having been nurtured continuously from my childhood in the love of truth, I could not endure to leave the question unsettled: rather I determined to set forth the truth thereof, and withal to disprove the arguments brought to

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l. 13. *apparentiam*, 'for display'; as in *Par.* xxix. 87 'l' amor dell' apparenza': ibid. 94 'per apparer ciascun s' ingegna'. Not 'judging according to appearance'.

menta facta contra dissolvere, tum veritatis amore tum etiam odio falsitatis. Et ne livor multorum, qui absentibus viris invidiosis mendacia confingere solent, post tergum bene dicta transmutent, placuit insuper, in hac cedula meis digitis exarata, quod determinatum fuit a me relinquere, et formam totius disputationis calamo designare.

§ 2. Quaestio igitur fuit de situ et figura, sive forma, duorum elementorum, aquae videlicet et terrae; et voco hic formam illam, quam Philosophus ponit in quarta specie qualitatis in *Praedicamentis*. Et restricta fuit quaestio ad hoc, tamquam ad principium investigandae veritatis, ut quaereretur: Utrum aqua in sphaera sua, hoc est in sua naturali circumferentia, in aliqua parte esset altior terra quae emergit ab aquis, et quam communiter quartam habitabilem appellamus; et arguebatur quod sic multis rationibus, quarum (quibusdam omissis propter

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l. 4. E *confugere.*

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l. 3. *invidiosis,* 'objects of envy or dislike': compare *Par.* x. 138 'invidiosi veri': unnecessarily corrected by Giuliani into 'invidiosa'.

the contrary, being moved thereto as well by love of truth as by hatred of falsehood. And, that the envious many, who love to coin untruths against men of worth, when they are out of the way, may not behind our back pervert what has been well said, I have resolved further to leave after me in this paper under my hand the conclusions I have established, and to set down in writing the order of the whole controversy.

§ 2. The question, then, was one touching the position and the shape or form of two of the elements, namely earth and water: and here I use form in the sense in which Aristotle in his *Categories* applies it to the fourth kind of quality. And the inquiry was limited to this one point, as the first step in the investigation of the truth, that we should discover whether water in its own sphere, that is, within its own natural circumference, be in any part higher than the land which stands out from the waters, and is commonly called by us the habitable quarter: and it was contended for the affirmative on many grounds, out of which,

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l. 4. *confingere.* The editio princeps (E) has 'confugere': corrected by Torri to 'confingere'.

l. 12. *in quarta specie qualitatis*: *τέταρτον δὲ γένος ποιότητος σχῆμά τε καὶ ἡ περὶ ἕκαστον ὑπάρχουσα μορφή. Categ.* viii. § 20.

earum levitatem) quinque retinui, quae aliquam efficaciam habere videbantur.

§ 3. Prima fuit talis: Duarum circumferentiarum inaequaliter a se distantium impossibile est idem esse centrum: circumferentia aquae et circumferentia terrae inaequaliter distant; ergo etc. Deinde procedebatur: Quum centrum terrae sit centrum universi, ut ab omnibus confirmatur; et omne quod habet positionem in mundo aliam ab eo sit altius; quod circumferentia aquae sit altior circumferentia terrae concludebatur, quum circumferentia sequatur undique ipsum centrum. Maior principalis syllogismi videbatur patere per ea, quae demonstrata sunt in geometria; minor per sensum, eo quod videmus in aliqua parte terrae circumferentiam includi a circumferentia aquae, in aliqua vero excludi.

omitting some of too slight value, I have reserved five, as having some show of validity.

§ 3. First Argument.

A. i. Two circumferences unequally distant cannot have the same centre.

ii. The circumferences of water and earth are unequally distant.

Ergo: They cannot have the same centre.

B. It then proceeded thus:

i. The centre of the earth is the centre of the universe, as is admitted by every one.

ii. Every place in the world, which occupies a position other than the centre, must be higher than the centre.

Ergo: The centre of the sphere of water is higher than the centre of the earth.

C. Every circumference follows its centre all round.

Ergo: The circumference of the sphere of water must be, somewhere, higher than the circumference of the sphere of earth.

The major premiss (A. i) of the principal syllogism was taken to be shown by the demonstrations of geometry: the minor (A. ii) by observation, because in one place we see the circumference of the earth to be within the circumference of water, and in another to be outside it.

§ 4. Secunda ratio: Nobiliori corpori debetur nobilior locus; aqua est nobilius corpus quam terra; ergo aquae debetur nobilior locus. Et quum locus tanto sit nobilior quanto superior, propter magis propinquare nobilissimo continenti, quod est coelum primum, relinquitur, quod locus aquae sit altior loco terrae, et per consequens quod aqua sit altior terra, quum situs loci et locati non differat. Maior et minor principalis syllogismi huius rationis quasi manifestae dimittebantur.

§ 5. Tertia ratio erat: Omnis opinio quae contradicit sensui est mala opinio; opinari aquam non esse altiorem terra est contradicere sensui; ergo est mala opinio. Prima dicebatur patere per Commentatorem super tertio *de Anima*; secunda, sive minor, per experientiam

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l. 6. E *quia*. E *relinquo*.

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l. 1. *Nobiliori corpori*: τῷ γὰρ τιμιωτάτῳ οἴονται προσήκειν τὴν τιμιωτάτην ὑπάρχειν χώραν, *De Caelo*, ii. 13.

l. 6. *relinquitur*, 'the conclusion to be drawn is,' &c.: E has 'relinquo'. See below, § 20, l. 44 'relinquitur quod terra', &c.: also Rog. Bacon, *Opus Majus* pt. iv. c. 10 'relinquitur quod aliquid impedit visum illius qui est in navi', where he is dealing with the problem discussed here in the next section.

§ 4. Second Argument.

A. i. The nobler body ought to have the nobler place.

ii. Water is a nobler body than earth.

Ergo: Water ought to have the nobler place.

B. The nobler place is the upper place, as being nearest to that most noble all-embracing sphere, the first heaven. It follows that the place of water is higher than the place of earth, and therefore that water is higher than earth, there being no difference between the situation of the place and the situation of the thing placed therein.

The major and minor of the principal syllogism (A. i: A. ii) were so clear that they required no proof.

§ 5. Third Argument.

An opinion which contradicts observation is bad.

The opinion that water is not higher than earth contradicts observation.

Ergo: It is a bad opinion.

The major of this syllogism was asserted to be proved by the Commentator on the third book *De Anima*; the minor by the experience

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l. 16. Arist. *de Anima*, iii. cap. 3 ἡ μὲν γὰρ αἴσθησις τῶν ἰδίων ἀεὶ ἀληθής.

nautarum, qui vident, in mari existentes, montes sub se; et probant dicendo, quod ascendendo malum vident eos, in navi vero non vident; quod videtur accidere propter hoc, quod terra valde inferior sit et depressa a dorso maris.

§ 6. Quarto arguebatur sic: Si terra non esset inferior ipsa aqua, terra esset totaliter sine aquis, saltem in parte detecta, de qua quaeritur; et sic nec essent fontes, neque flumina, neque lacus; cuius oppositum videmus: quare oppositum eius ex quo sequebatur est verum, scilicet quod aqua sit altior terra. Consequentia probabatur per hoc, quod aqua naturaliter fertur deorsum; et quum mare sit principium omnium aquarum (ut patet per Philosophum in *Meteoris* suis), si mare non esset altius quam terra, non moveretur aqua ad ipsam terram; quum in

l. 2. E omits *et.* l. 11. E *s.* for *scilicet.* l. 15. E *Metauris.*

l. 2. *et probant*: E *probant*. Other suggested readings are *probatur, probabatur.*

l. 7. *ipsa aqua*: *ipsam terram.* The pronoun here has only the force of the definite article.

l. 10. *quare oppositum.* For the like form of argument see *De Mon.* II. xii. 26; xiii. 3. *Oppositum*, ἀντικείμενον, is equivalent to 'contradictory', as ἐναντίον is to 'contrary': Arist. *De Interpr.* 7.

l. 11. *scilicet.* In ed. prin. *s.*; rightly expanded in edition of 1576 to *scilicet*: omitted by Torri and others. Perhaps so contracted in the MS. used by Moncetti.

of seamen, who when they are afloat see the mountains below them, as they prove by saying that they can see them from the mast-head but not from the deck: and this they think is accounted for by the land being much below the ridge of the sea.

§ 6. Fourth Argument.

If the earth were not lower than the water, it would, at least in its exposed part, that now in question, be wholly without water: there would be no springs or rivers or lakes. But, as we see, the contradictory of this conclusion is true: and therefore the contradictory of the antecedent is also true: and water is shown to be higher than earth. The proof of the consequence was this: Water naturally moves downward, the sea being the source of all waters, as is shown by Aristotle in his *Meteora*[a]; and, if the sea were not higher than the earth, water would not move

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l. 12. *Consequentia*, the dependence of the consequent of the hypothetical proposition on its antecedent: *consequens* is the conclusion drawn from the argument.

l. 15. *Meteoris*. The corrupt form *Metaura* occurs also in the MSS. of the *Convivio*, IV. xxiii. 125, where the *Meteora* of Albertus Magnus is referred to. The opponents are misquoting Aristotle: in the passage referred to it is not Aristotle, but οἱ πρότεροι, who held the sea to be the source of water: his own opinion was the contrary, and is rightly adopted by the author of the *Quaestio* in § 23.

[a] Arist. *Meteor.* ii. 2 fin. (356ª. 33, b. 1).

omni motu naturali aquae principium oporteat esse altius.

§ 7. Item arguebatur quinto: Aqua videtur maxime sequi motum Lunae, ut patet in accessu et recessu maris; quum igitur orbis Lunae sit excentricus, rationabile videtur quod aqua in sua sphaera excentricitatem imitetur orbis Lunae, et per consequens sit excentrica; et quum hoc esse non possit, nisi sit altior terra, ut in prima ratione ostensum est, sequitur idem quod prius.

§ 8. His igitur rationibus, et aliis non curandis, conantur ostendere suam opinionem esse veram, qui tenent aquam esse altiorem terra ista detecta, sive habitabili, licet in contrarium est sensus et ratio. Ad sensum enim videmus, per totam terram flumina descendere ad mare, tam meridionale quam septentrionale, tam orientale quam occidentale; quod non esset, si principia fluminum et tractus alveorum non essent altiora ipsa superficie maris. Ad rationem vero patebit inferius; et hoc multis

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l. 6. *excentricus.* Ancient astronomy supposed the moon to revolve round the earth in a circular path, having a different centre from the centre of the earth.

towards the earth: for in all natural movements of water, the place it starts from must be the higher.

§ 7. Fifth Argument.

Water is seen to be governed in a high degree by the motion of the moon, as is apparent in the ebb and flow of the sea: therefore, the moon's orbit being excentric, reason requires that water should in its sphere imitate the excentricity of the moon's orbit, and consequently be excentric. This can only be brought about by the water being higher than the land, as was proved by the first argument: and the same conclusion follows as before.

§ 8. By these arguments, then, and by others of no importance, they endeavour to establish the truth of that opinion of theirs, which holds water to be higher than the exposed or habitable land, notwithstanding that both observation and reason go to the contrary. The argument from observation is this, that we see over the whole earth the rivers flowing downwards to the sea, whether that be north or south or east or west: and this could not be unless the sources of the rivers and the courses of their channels were higher than the surface of the sea. The argument from reason will

rationibus demonstrabitur, in ostendendo sive determinando de situ et forma duorum elementorum, ut superius tangebatur.

§ 9. Hic erit ordo. Primo demonstrabitur impossibile, aquam in aliqua parte suae circumferentiae altiorem esse hac terra emergente, sive detecta. Secundo demonstrabitur, terram hanc emergentem esse ubique altiorem totali superficie maris. Tertio instabitur contra demonstrata, et solvetur instantia. Quarto ostendetur causa finalis et efficiens huius elevationis sive emergentiae terrae. Quinto solvetur ad argumenta superius praenotata.

§ 10. Dico ergo propter primum, quod si aqua, in sua circumferentia considerata, esset in aliqua parte altior quam terra, hoc esset de necessitate altero istorum duorum modorum; vel quod aqua esset excentrica, sicut prima et quinta ratio procedebat; vel quod, concentrica existens, esset gibbosa in aliqua parte, secundum quam terrae supereminet; aliter esse non posset, ut subtiliter inspicienti satis manifestum est. Sed

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l. 19. *concentrica* : E *ecentrica.*

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l. 1. *ostendendo*: = *ἀποδεικνύναι*, 'proof by syllogism.'
l. 2. *determinando*: = *διορίζειν*, 'proof by definition.'

be given below, and our conclusions will be demonstrated by many methods, proving or establishing the position and form of the two elements, as already noticed above.

§ 9. Our order will be as follows. First, we shall show it to be impossible, that water can in any part of its circumference be higher than the elevated or exposed land. Secondly, we shall show that this elevated land is everywhere higher than the level of the surface of the sea. Thirdly, objections will be stated against these conclusions, and we shall refute those objections. Fourthly, we shall establish the final and efficient cause of this elevation or exposure of the land. Fifthly, we shall refute the arguments already noticed above (§§ 3, 4, 5, 6, 7).

§ 10. Under the first head, then, I say that water looked upon in its own circumference (i. e. *as part of its own natural sphere*) can only be somewhere higher than the land in one of these two ways: either, by being excentric, which was the basis of the first and fifth arguments: or, by being concentric, but in some part irregularly elevated or gibbous, and in that part rising above the land. It can happen in no other way, as is clear enough on attentive

Author's argument.

l. 21. *ut subtiliter*: cf. *Conv.* II. iv. 61 'come può vedere chi bene considera'.

neutrum istorum est possibile; ergo nec illud ex quo alterum vel alterum sequebatur. Consequentia, ut dicitur, est manifesta per locum a sufficienti divisione causae; impossibilitas consequentis per ea quae ostendentur apparebit.

§ 11. Ad evidentiam igitur dicendorum, duo supponenda sunt: primum est, quod aqua naturaliter movetur deorsum; secundum est, quod aqua est labile corpus naturaliter, et non terminabile termino proprio. Et si quis haec duo principia vel alterum ipsorum negaret, ad ipsum non esset determinatio; quum contra negantem principia alicuius scientiae non sit disputandum in illa scientia, ut patet ex primo *Physicorum*; sunt etenim haec principia inventa sensu et inductione, quorum est talia invenire, ut patet ex primo *ad Nicomachum*.

§ 12. Ad destructionem igitur primi membri consequentis dico, quod aquam esse excentricam

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l. 2. *consequentia* : *consequens*. See above, § 6. 8 : and compare *De Mon.* II. xii. 30, 35.

l. 3. *per locum a sufficienti divisione* : Arist. *Rhet.* ii. 23, 10. One of the topics, τόποι τῶν δεικτικῶν, is that ἐκ διαιρέσεως. εἰ πάντες τριῶν ἕνεκεν ἀδικοῦσιν· ἢ τοῦδε γὰρ ἕνεκα ἢ τοῦδε ἢ τοῦδε.

l. 12. *contra negantem* : ὥσπερ καὶ τῷ γεωμέτρῃ οὐκέτι λόγος ἐστὶ πρὸς τὸν ἀνελόντα τὰς ἀρχάς, *Phys.* i. 2. § 2.

consideration. But neither of these ways is possible: and therefore the antecedent proposition, from which one or other of these alternatives would follow, must be impossible too. The consequence, as we say, is made clear through the familiar commonplace of exhaustive division applied to the cause. The impossibility of the conclusion will be shown by the syllogistic proof which will follow.

§ 11. To make clear what we are going to say, two preliminary assumptions must be allowed: first, that water naturally moves downward: secondly, that water is naturally a fluid body, and has no proper boundary of its own. No argument is possible with one who denies these two principles, or either of them: for as Aristotle teaches in the first book of the *Physics*, there is no disputing in any science with one who denies the principles of that science: these principles having been discovered by observation and induction, the proper means for doing so, as is shown in the first book of the *Nicomachean Ethics*.

§ 12. To disprove, then, the first alternative of the conclusion, I say that it is impossible for

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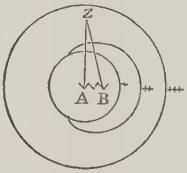
l. 15. *haec principia*: τῶν ἀρχῶν δ' αἱ μὲν ἐπαγωγῇ θεωροῦνται, αἱ δὲ αἰσθήσει, αἱ δ' ἐθισμῷ τινί, καὶ ἄλλαι δ' ἄλλως, *Eth. Nic.* i. 7, § 21.

est impossibile; quod sic demonstro: Si aqua esset excentrica, tria impossibilia sequerentur; quorum primum est, quod aqua esset naturaliter mobilis sursum et deorsum; secundum est, quod aqua non moveretur deorsum per eandem lineam cum terra; tertium est, quod gravitas aequivoce praedicaretur de ipsis; quae omnia non tantum falsa sed impossibilia esse videntur. Consequentia declaratur sic: Sit coelum circumferentia, in qua tres cruces, aqua in qua duae, terra in qua una; et sit centrum coeli et terrae punctus in quo A, centrum vero aquae excentricae punctus in quo B; ut patet in figura



signata. Dico ergo quod, si aqua erit in A, et habeat transitum, quod naturaliter movebitur ad B; quum omne grave moveatur ad centrum propriae circumferentiae naturaliter; et quum moveri ab A ad B sit moveri sursum; quum A sit simpliciter deorsum ad omnia; aqua

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In E the letter Z is drawn thus: 3.

water to be excentric; and I prove it thus: If water were excentric, three impossible results would follow: first, water would have a natural movement, both upwards and downwards: secondly, water would not move downwards in the same line as earth: thirdly, gravity would be predicated in an equivocal sense in the two cases: all which are evidently not only false but impossible. The argument is made clear by this figure, where the circumference of heaven is marked by three crosses (× × ×), of water by two (× ×), of earth by one (×), the centre of heaven and of earth by the point A, and the centre of the excentric sphere of water by the point B.

Now I say that if there be water at A, and there be a free passage for it, it will naturally move to B, the centre of its proper circumference, for every heavy body moves naturally to its own centre. Then A being the absolutely lowest place, movement from A to B is movement upwards: so that here water will be moving naturally upwards. This *contradicts the assumption allowed above, i. e. that water*

movebitur naturaliter sursum; quod erat primum impossibile, quod sequi dicebatur. Praeterea sit gleba terrae in Z, et ibidem sit quantitas aquae, et absit omne prohibens; quum igitur, ut dictum est, omne grave moveatur ad centrum propriae circumferentiae, terra movebitur per lineam rectam ad A, et aqua per lineam rectam ad B; sed hoc oportebit esse per lineas diversas, ut patet in figura signata; quod non solum est impossibile, sed rideret Aristoteles, si audiret; et hoc erat secundum quod declarari debebatur. Tertium vero declaro sic: Grave et leve sunt passiones corporum simplicium, quae moventur motu recto; et levia moventur sursum, gravia vero deorsum. Hoc enim intendo per grave et leve, quod sit mobile; sicut vult Philosophus in *Coelo et Mundo*. Si igitur aqua moveretur ad B, terra vero ad A; quum ambo sint corpora gravia, movebuntur ad diversa deorsum; quorum una ratio esse non potest, quum unum sit deorsum simpliciter, aliud vero secundum quid.

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l. 11. *Aristoteles*. *Conv.* IV. xv. 58: 'Senza dubbio forte riderebbe Aristotile, udendo fare due spezie dell' umana generazione, siccome de' cavalli e degli asini: chè (perdonimi Aristotile) asini ben si possono dire coloro che così pensano.'

naturally moves downwards; *and* is the first of the three impossible results which were said to follow.

Further, suppose a particle of earth and also a certain quantity of water to be at Z, and nothing to obstruct their free passage: then, as all heavy bodies move to the centre of their own circumference (see above), the particle of earth will move along a straight line to A, and the water along a straight line to B: and these will be two different lines, as shown in the figure here drawn. This result is not only impossible, but to Aristotle would appear ridiculous. It is the second of the three impossible results which we undertook to demonstrate. The third I establish thus: Heaviness and lightness are affections of simple bodies, which have a straightforward movement: light bodies move up, heavy bodies move down. This is the meaning of heavy and light, as used of moveable bodies, according to the view of Aristotle in the *De Caelo et Mundo*. Water and Earth are both heavy bodies: and if the water move to B but the earth to A, they will be moving downwards in different directions: and these directions cannot be reduced to the same principle, for one is absolutely downward, the other only

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l. 17. *quod sit mobile*: *βαρὺ γὰρ καὶ κοῦφον τῷ δύνασθαι κινεῖσθαι φυσικῶς πως λέγομεν*, *De Caelo*, iv. 1.

Et quum diversitas in ratione finium arguat diversitatem in his quae sunt propter illa, manifestum est quod diversa ratio gravitatis erit in aqua et in terra; et quum diversitas rationis cum identitate nominis aequivocationem faciat, ut patet per Philosophum in *Antepraedicamentis*; sequetur quod gravitas aequivoce praedicetur de aqua et terra; quod erat tertium consequentiae membrum declarandum. Sic igitur patet per veram demonstrationem de genere illarum, quae demonstrant non esse hoc, quod aqua non est excentrica; quod erat primum consequentis principalis consequentiae quod destrui debebatur.

§ 13. Ad destructionem secundi membri consequentis principalis consequentiae dico, quod aquam esse gibbosam est etiam impossibile; quod sic demonstro: Sit coelum, in quo quatuor [*cruces*], aqua in quo tres, terra in quo

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l. 3. E *fluitatis*. l. 19. E om. *cruces*.

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l. 5. *aequivocationem*: Ὁμώνυμα λέγεται ὧν ὄνομα μόνον κοινόν, ὁ δὲ κατὰ τοὔνομα λόγος τῆς οὐσίας ἕτερος, *Categ.* i. 1.

l. 11. *quae demonstrant*. E reads *qua demonstravit*, for which Signor Boffito has proposed *quibus demonstrant*, though it is palaeographically a much greater change

relatively so. Now, as diversity of ends argues diversity of means, it is clear that the principle of gravity in water and in earth will be different: and as difference of principle under identity of name results in equivocation (see Aristotle, *Categ.* i. 1), it will follow that gravity will be used equivocally of water and of earth: and this is the third division of the argument, *and the last of the three impossible results to be demonstrated.* It is, therefore, now clear, by a true demonstration, of the class of arguments which are used to prove the contrary, that water is not excentric: and this was the first alternative of the conclusion of the principal chain of argument, and was what we undertook to disprove.

§ 13. To disprove the second alternative, I affirm it to be also impossible for water to be irregularly elevated or gibbous: and I prove it by this figure:

Sphere of Heaven	× × × ×
Sphere of Water	× × ×
Sphere of earth	× ×

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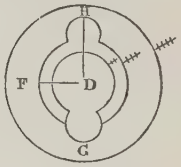
than the Oxford reading. But in any case the meaning intended seems to be that the whole argument is *per impossibile,* and is in that respect like the argument used by the opponent in § 7, 'quum hoc esse non potuit nisi sit altior terra.' Cf. § 15 ad fin.

duae; et centrum terrae et aquae concentricae et coeli sit D. Et praesciatur hoc, quod aqua non potest esse concentrica terrae, nisi terra sit in aliqua parte gibbosa supra centralem circumferentiam (ut patet instructis in mathematicis), si in aliqua parte emergit a circumferentia aquae. Et ideo gibbus aquae sit in quo H, gibbus vero terrae in quo G; deinde protrahatur linea una a D ad H, et una alia a D ad F;



manifestum est quod linea quae est a D ad H est longior quam quae est a D ad F; et per hoc summitas eius est altior summitate alterius; et quum utraque contingat in summitate sua superficiem aquae, neque transcendat; patet quod aqua gibbi erit sursum per respectum ad superficiem ubi est F. Quum igitur non sit ibi prohibens (si vera sunt quae prius supposita erant), aqua gibbi dilabetur, donec coaequetur ad D cum circumferentia centrali sive regulari;

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l. 6. *si in aliqua.* The reading of E. Signor Boffito proposes *scilicet*, but gives no reasons.

Centre of Spheres of Earth, of concentric Water, and of Heaven	D
A point on the circumference of the Sphere of Water	*F*
A projection on the Sphere of Earth	G
A projection on the Sphere of Water	H

Now I make this postulate: Water cannot be concentric with earth, if earth anywhere rises out of the circumference of water, unless there be somewhere above the regular circumference of earth, as drawn from its centre, a gibbous elevation: the necessity of this will be clear to all versed in mathematics.

We will assume then a protuberance of Water at H, and of Earth at G: draw a line from D to H and another from D to F: the line DH is longer than DF: therefore the vertex of the line DH is higher than the vertex of DF. But each of these lines touches the surface of the water at its vertex, without going beyond it. Therefore the water forming the protuberance, compared with the water on the surface at F, is relatively higher: and as nothing is there to prevent the water from moving, then, if our first assumptions are true (§ 11, *supra*), the water forming the protuberance will flow apart, until its distance from D becomes equal to that of the surface of

et sic impossibile erit permanere gibbum, vel esse; quod demonstrari debebat. Et praeter hanc potissimam demonstrationem potest etiam probabiliter ostendi, quod aqua non habeat gibbum extra circumferentiam regularem; quia quod potest fieri per unum, melius est quod fiat per unum quam per plura; sed totum supposition potest fieri per solum gibbum terrae, ut infra patebit; ergo non est gibbus in aqua; quum Deus et natura semper faciat et velit quod melius est, ut patet per Philosophum *de Coelo et Mundo*, et secundo *de Generatione Animalium*. Sic igitur patet de primo sufficienter; videlicet, quod impossibile est aquam in aliqua parte suae circumferentiae esse altiorem, hoc est remotiorem ad centrum mundi, quam

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l. 7. E *oppositum*.

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l. 5. *quia quod potest*: cf. *De Mon.* I. xiv. 1 'quod potest fieri per unum, melius est per unum fieri quam per plura'.

l. 7. *suppositum*. The suggestion of Signor Russo for *oppositum*, the reading of E: and this gives the sense required. *Suppositum* represents ὑποκείμενον, the subject matter, the fact under discussion; in this case the fact that Earth does show itself outside the water.

l. 10. *Deus et natura*: ὁ δὲ θεὸς καὶ ἡ φύσις οὐδὲν μάτην ποιοῦσιν, *De Caelo*, i. 4 ad fin. ἡ δὲ φύσις οὐδὲν

the regular sphere, described about its centre: and from this it follows that it will be impossible for the protuberance to remain permanent, or indeed to exist at all: this being what we undertook to prove.

And besides this complete demonstration, it can also be shown on grounds of probability that water cannot have any protuberance extending outside its regular circumference: for it is a maxim that where a result can be produced by a single cause, it is better that it should be produced by that single cause than by more than one. Here the whole purpose, *the elevation of land above the water*, can be effected, as will be shown below, without requiring more than that there shall be a protuberance of the earth: and consequently no protuberance of the water is necessary; for God and nature always act and intend in the best possible way (see Aristotle *De Caelo et Mundo*, and *De Generatione Animalium*, ii).

This, then, is a sufficient proof of the first matter undertaken (§ 9), which was to prove that water cannot in any part of its circumference be higher, that is, farther from the centre of the world, than is the surface of this

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ποιεῖ περίεργον, *De Gen. Anim.* ii. 4 § 28, 5 § 8, 6 § 38.

sit superficies huius terrae habitabilis; quod erat primum in ordine dicendorum.

§ 14. Si ergo impossibile est aquam esse excentricam, ut per primam figuram demonstratum est; et esse cum aliquo gibbo, ut per secundam est demonstratum; necesse est ipsam esse concentricam et coaequam, hoc est aequaliter in omni parte suae circumferentiae distantem a centro mundi; ut de se patet.

§ 15. Nunc arguo sic: Quidquid supereminet alicui parti circumferentiae distantis aequaliter a centro, est remotius ab ipso centro quam aliqua pars ipsius circumferentiae; sed omnia littora, tam ipsius Amphitritis, quam marium mediterraneorum, supereminent superficiei contingentis maris, ut patet ad oculum; ergo omnia littora sunt remotiora a centro mundi, quum centrum mundi sit centrum maris (ut visum est), et superficies littorales sint partes totalis superficiei maris; et quum omne remotius a centro mundi sit altius; consequens est quod

l. 3. E *aquam esse . . . centricam.* l. 5. E om. *ut.* l. 8. E *distante.*

l. 14. *Amphitritis.* Used of the Ocean in the *Epistle to Henry VII,* an undoubtedly genuine work of Dante.
l. 20. *quum omne* : vide 3. 8 ; 12. 23–6.

habitable land: and this was the first in order of the matters we were to speak of.

§ 14. If then water cannot be excentric, as has been shown by the first figure, nor have any protuberance, as has been shown by the second, it follows that it must be concentric with the earth, and of one level, that is, in every part of its circumference equally distant from the centre of the world: as is self-evident.

§ 15. Now I proceed *to the proof of the second proposition* (§ 9), *that the elevated land is everywhere higher than the level of the surface of the sea.*

Whatever rises above any part of a circumference equally distant from its centre is farther from that centre than any part of that circumference. But the shores, as well of the ocean, as of the inland seas, rise above the surface of the sea which they touch, as is clear to the eye. Therefore the shores are all farther from the centre of the world than the sea is, the centre of the world being, as we have seen, the centre of the sea also, and the surface of the sea at the shores being part of the general surface of the sea.

Whatever is farther from the centre of the world is higher: consequently, all the shores

littora omnia sint supereminentia toti mari; et si littora, multo magis aliae regiones terrae, quum littora sint inferiores partes terrae; et id flumina ad illa descendentia manifestant. Maior vero huius demonstrationis demonstratur in theorematibus geometricis; et demonstratio est ostensiva, licet vim suam habeat, ut in his quae demonstratae sunt superius, per impossibile. Et sic patet de secundo.

§ 16. Sed contra ea quae sunt determinata sic arguitur: Gravissimum corpus aequaliter undique ac potissime petit centrum; terra est gravissimum corpus; ergo aequaliter undique ac potissime petit centrum. Et ex hac conclusione sequitur, ut declarabo, quod terra aequaliter in omni parte suae circumferentiae distet a centro, per hoc quod dicitur *aequaliter*; et quod sit substans omnibus corporibus, per hoc quod dicitur *potissime*; unde sequeretur (si aqua esset concentrica, ut dicitur), quod terra undique esset circumfusa et latens;

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l. 7. *ut in his.* The reading of E. Signor Boffito proposes *utique.*

are higher than and are raised above the level of the sea: and if the shores, which, as is shown by the rivers flowing down to them, are the lower portions of the land, then, *a fortiori*, the other regions of the earth.

The major of this proof is shown in the theorems of geometry: and the proof is direct, although its force is derived, as was the case with the proofs given above, from an argument 'per impossibile'.

We have now made clear our second proposition.

§ 16. But against these conclusions our opponent argues thus. The heaviest body draws to its centre equally from every part and to a greater degree than all other bodies. Earth is the heaviest body. *Ergo* earth draws to its centre equally from every part and to the greatest degree of all bodies. From this there follow, as I shall state the argument, these conclusions: *first*, that by virtue of its equal tendency to draw to its centre, earth is in every part of its circumference equally distant from its centre: and *secondly*, that by virtue of its superior centripetal tendency, earth finds its place below all other bodies: whence it would follow that, if, as is asserted, water were concentric with the earth, the earth would spread about the centre of the world on every side and be con- Opponent's reply.

cuius contrarium videmus. Quod illa sequantur ex conclusione, sic declaro: Ponamus per contrarium sive oppositum consequentis illius, quod est in omni parte aequaliter distare, et dicamus quod non distet; et ponamus quod ex una parte superficies terrae distet per viginti stadia, ex alia per decem; et sic unum hemisphaerium eius erit maioris quantitatis quam alterum; nec refert utrum parum vel multum diversificentur in distantia, dummodo diversificentur. Quum ergo maioris quantitatis terrae sit maior virtus ponderis, hemisphaerium maius per virtutem sui ponderis praevalentem impellet hemisphaerium minus, donec adaequetur quantitas utriusque, per cuius adaequationem adaequetur pondus; et sic undique redibit ad distantiam quindecim stadiorum; sicut et videmus in appensione ac adaequatione ponderum in bilancibus. Per quod patet, quod impossibile est terram aequaliter centrum petentem diversimode sive inaequaliter in sua circumferentia distare ab eo. Ergo necessarium est oppositum suum, quod est aequaliter distare, quum distet; et sic

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l. 22. *oppositum suum*, &c. E reads *opp. suum inaequaliter distare quod est*, &c. The two words here omitted appear to be a gloss and are unnecessary. Signor Angelitti suggests *eius* for *suum*.

cealed there: the contrary whereof we see to be the case.

That these consequences must follow I show thus. Assume the contrary or opposite of the first conclusion, and say that Earth is not in every part of its circumference equally distant from the centre: and suppose the surface of the earth to be on one side twenty stades distant from the centre, and on another ten stades: so that one hemisphere will be greater in quantity than the other. The difference may be much or little, but there must be some difference. Where the quantity is greater, the weight will be greater: and the larger hemisphere will by the superior force of its weight drive the smaller hemisphere before it, until the quantities of the two become equal, and thereby the weights become equal also. The surface of the earth will then settle to a distance of fifteen stades all round: just as we see it happen in weighing and adjusting weights in the scales. Whence it is plain that earth, which is attracted to the centre equally from every part, cannot in any part of its circumference be diversely or unequally distant from the centre. Therefore the opposite of this position is necessarily true: that is to say, earth, if at a distance from the centre, is equally distant; and so the argument

declarata est consequentia, quantum ex parte eius quod est aequaliter distare. Quod etiam sequatur, ipsam substare omnibus corporibus (quod sequi etiam ex conclusione dicebatur), sic declaro: Potissima virtus potissime attingit finem; nam per hoc potissima est, quod citissime ac facillime finem consequi potest; potissima virtus gravitatis est in corpore potissime petente centrum, quod quidem est terra; ergo ipsa potissime attingit finem gravitatis, qui est centrum mundi; ergo substabit omnibus corporibus, si potissime petit centrum; quod erat secundo declarandum. Sic igitur apparet esse impossibile quod aqua sit concentrica terrae; quod est contra determinata.

§ 17. Sed ista ratio non videtur demonstrare, quia propositio maior principalis simpliciter non videtur habere necessitatem. Dicebatur enim, gravissimum corpus aequaliter undique ac potissime petit centrum; quod non

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l. 9. E *quicquid* pro *quod quidem.* l. 17. E *maioris.* E *similiter.*

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l. 4. See above, p. 30, l. 17.

l. 10. *centrum mundi.* The centre of the earth is also the centre of the universe: *συμβέβηκε δὲ ταὐτὸ μέσον εἶναι τῆς γῆς καὶ τοῦ παντός*, *De Caelo*, ii. 14.

has been proved, so far as touches the point of equality of distance.

And that there is this further result, also alleged to follow from the argument, that the place of earth is below that of all other bodies, I prove thus. The most efficient force attains its end in the most efficient way: for its efficiency consists in this, *that its effect is most rapid*, that it attains its end most rapidly and easily. The force of gravity is shown at its greatest in the body which draws most strongly to its centre, and that body is earth: therefore it is earth that best attains the end of gravity, which is the centre of the world: and earth, as it excels all other bodies in its centripetal tendency, will underlie them all. And this was the second point to be proved. Thus it has been shown that water cannot be concentric with the earth: which is contradictory to the previous conclusion.

§ 17. But this argument is not conclusive: because the major premiss of the principal argument, which was that the heaviest body draws to its centre equally all round and to a greater degree than all other bodies, does not, taken without qualification, seem to be neces- Author's answer.

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l. 17. *simpliciter*: E *similiter*. Signor Russo suggests *sillogismi*.

videtur esse necessarium; quia, licet terra sit gravissimum corpus comparatum ad alia corpora, comparatum tamen in se, secundum suas partes, potest esse gravissimum et non gravissimum; quia posset esse gravior terra ex una parte quam ex altera. Nam quum adaequatio corporis gravis non fiat per quantitatem, in quantum quantitas, sed per pondus; poterit ibi esse adaequatio ponderis, quando non sit ibi adaequatio quantitatis; et sic illa demonstratio est apparens, et non existens.

§ 18. Sed talis instantia nulla est, procedit enim ex ignorantia naturae homogeneorum et simplicium; corpora enim homogenea et simplicia (sunt homogenea, ut aurum depuratum, et corpora simplicia, ut ignis et terra) regulariter in suis partibus qualificantur omni naturali passione. Unde, quum terra sit corpus simplex, regulariter in suis partibus qualificatur, naturaliter et per se loquendo; quare quum gravitas insit naturaliter terrae, et terra sit corpus simplex, necesse est ipsam in omnibus partibus suis regularem habere gravitatem,

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l. 3. E *sed* pro *secundum*. l. 9. E *quod non sit*.

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l. 6. *adaequatio*, 'comparison.' So Milton: 'His

sarily true: for though earth is the heaviest body compared with other bodies, yet in itself, comparing its parts with one another, it may be the heaviest and yet not the heaviest: for it may be heavier in one part than in another. For the comparison of heavy bodies is made not by quantity, *quâ* quantity, but by weight: and it may be that the weights will be equal, although the quantities are unequal: and the proof given above is therefore apparent only and not real.

Opponent's further reply.

§ 18. But this objection, *our opponent has replied*, is of no validity, because it arises from ignorance of the nature of homogeneous and simple bodies: for homogeneous and simple bodies (homogeneous being such as refined gold, and simple bodies such as fire and earth) are affected regularly in all their parts by every natural quality. Wherefore, earth being a simple body, it is regularly so affected in all its parts, speaking of it according to its nature and in itself. And therefore, heaviness being naturally a property of earth, and earth being a simple body, it follows that it must possess a regular degree of heaviness in all its

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spear, to *equal* which the tallest pine . . . were but a wand.'—*Par. Lost*, i. 292.

l. 9. *quando non sit ibi*. E reads *quod non*, &c.

l. 14. *et simplicia* (*sunt homogenea, ut*, &c.). E punctuates 'et simplicia sunt. Omogenea ut', &c.

secundum proportionem quantitatis; et sic cadit ratio instantiae principalis. Unde respondendum est, quod ratio instantiae sophistica est, quia fallit secundum quid et simpliciter.

Propter quod sciendum est quod natura universalis non frustratur suo fine; unde, licet natura particularis aliquando propter inobedientiam materiae ab intento fine frustretur, natura tamen universalis nullo modo potest a sua intentione deficere; quum naturae universali aequaliter actus et potentia rerum, quae possunt esse et non esse, subiaceat. Sed intentio naturae universalis est, ut omnes formae quae sunt in potentia materiae primae redu-

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l. 1. E *sed proportionem.* l. 2. E *adhuc* pro *cadit.* ll. 4, 5. E *simpliciter propter quod. Sciendum est*, &c. l. 5. E *universali.* l. 10. E *natura.* l. 14. E *impotentia.*

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l. 1. *et sic cadit ratio*, &c. E reads *et sic adhuc ratio*, &c. Some word like *cadit*, *perit*, or *nulla est* is wanted. The conjecture here adopted, *cadit*, is perhaps palaeographically the nearest to the original text.

l. 2. *instantiae principalis*: the objection brought against the principal argument. Cf. *Top.* iii. 2 *Ἔνστασις τούτου ὅτι οὐκ ἀληθές*: iv. 3 *Ἔνστασις τούτου ὅτι ὑγιείας καὶ νόσου οὐδὲν μεταξύ*: iv. 6 ad fin. *Ἔνστασις δ' αὐτοῦ* κτλ. The reference is to § 17 init. 'propositio maior principalis'.

l. 5. *Propter quod.* E reads *simpliciter, propter*

parts, in proportion to its quantity: and this destroys the reasoning of the objection brought against the principal major proposition of his argument: and his answer is that the reasoning of the objection is sophistical, because it contains the fallacy of arguing 'a dicto secundum quid ad dictum simpliciter'.

Author's new argument.

On this account we must *take higher ground and* observe that universal nature is never disappointed of its end: and therefore, although particular nature may sometimes, owing to the intractability of matter, be disappointed of its purposed end, yet universal nature cannot in any way fail of its purpose, seeing that both the actuality and the potentiality of things contingent (things which may be and may not be) are equally subject to universal nature. Now, it is the intention of universal nature, that all forms which lie within the potentiality of primal matter should be brought into actuality,

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quod. Sciendum est, &c. But the recognized distinction is between *simpliciter* and *secundum quid* as in § 12, l. 50. With *Propter quod sciendum est* a wholly new line of argument is entered upon.

natura universalis. Dr. Moore has pointed out (*Studies*, i. 154) the frequent use made by Dante elsewhere of the distinction between Universal and Particular Nature.

l. 7. *inobedientiam materiae.* Cf. *Par.* i. 129 'Perch' a risponder la materia è sorda'.

cantur in actum, et secundum rationem speciei sint in actu; ut materia prima, secundum suam totalitatem, sit sub omni forma materiali, licet secundum partem sit sub omni privatione sup- 35
posita, praeter unam. Nam quum omnes formae, quae sunt in potentia materiae idealiter, sint in actu in Motore coeli, ut dicit Commentator in *de Substantia Orbis*; si omnes istae formae non essent semper in actu, Motor 40
coeli deficeret ab integritate diffusionis suae bonitatis; quod non est dicendum. Et quum omnes formae materiales generabilium et corruptibilium, praeter formas elementorum, re- 45
quirant materiam et subiectum mixtum et complexionatum, ad quod, tanquam ad finem, ordinata sunt elementa in quantum elementa;

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l. 4. E *privatur opposita.* l. 6. E *impotentia.* l. 7. E *Commentater.* l. 8. E *inde* pro *in de.*

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l. 7. *Commentator in de Substantia Orbis.* This opinion, as a matter of fact, appears to come, not from Averroes, *De Substantia Orbis*, but from the *De natura et origine animae* (II. vii.) of Albertus Magnus, who attributes it to Plato: 'Dixit Plato formas omnes ideales esse in mente divina antequam prodirent in corpora: sicut formae ideales artificialium sunt in mente artificis antequam in materias artium traducantur.' (See Toynbee's *Dante Dictionary*, s. v. Averroes.)

and be in actuality according to the principle of their kind: so that primal matter, regarded in its totality, must admit of every material form, although, regarded in any given part of it, it is under every deprivation except one (i. e. *is capable of one material form only*). For seeing that all forms, which exist ideally in the potentiality of matter, exist actually in the Mover of the Heavens (see the Commentator in *De Substantia Orbis*), unless all these forms were always actual, the Mover of the Heavens would fall short of the complete diffusion of his goodness: a conclusion which is intolerable. All the material forms of those things which admit of generation and decay, except the forms of the elements, require for their material and their base something mixed and composite, this being the purpose for which the elements, as elements, were ordained: and there can be

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l. 15. *complexionatum*: composed of the four elements, fire, water, air, and earth, or some of them, their respective qualities being hot, moist, cold, dry: hence the four complexions, Choleric, Phlegmatic, Sanguine, Melancholic. *Hen. V*, III. vii: 'my horse is pure air and fire: and the dull elements of earth and water never appear in him.'

Par. vii. 140:

'L' anima d' ogni bruto e delle piante
Da complession potenziata tira
Lo raggio e il moto delle luci sante.'

et mixtio esse non possit, ubi miscibilia simul esse non possunt, ut de se patet; necesse est, esse partem in universo ubi omnia miscibilia, scilicet elementa, convenire possint; haec autem esse non posset, nisi terra in aliqua parte emergeretur, ut patet intuenti. Unde quum intentioni naturae universalis omnis natura obediat; necesse fuit etiam simplici naturae terrae, quae est esse deorsum, inesse aliam naturam per quam obediret intentioni universalis naturae; ut scilicet pateretur elevari in parte a virtute coeli, tanquam obediens a praecipiente; sicut videmus de concupiscibili et irascibili in homine; quae licet secundum proprium impetum ferantur secundum sensitivam affectionem, secundum tamen quod rationi obedibiles sunt, quandoque a proprio impetu retrahuntur, ut patet ex primo *Ethicorum*.

§ 19. Et ideo, licet terra secundum simplicem eius naturam aequaliter petat centrum, ut in ratione instantiae dicebatur; secundum tamen naturam quandam patitur elevari in

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l. 2. E om. *non*. l. 8. E *simplicem naturam*.
l. 15. E *sed* pro *secundum*. l. 21. E *sed* pro *secundum*.

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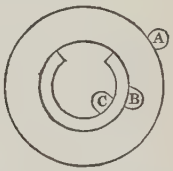
l. 18. *Ethica*, I. xiii.

no mixture, where the things to be mixed cannot come into contact with one another, as is clear on the face of the matter. Therefore there must be some part in the universe where all the things to be mixed, namely, the elements, can come together: and this could only be possible by the earth being outside the water somewhere, as is clear when you consider it. Seeing then that every nature is in obedience to the purpose of universal nature, it became necessary for earth to possess, besides its simple nature, which is to have a downward tendency, another nature enabling it to obey the purpose of universal nature: that is to say, a nature which would allow it somewhere to be raised up by the influence of the heavens, as if in obedience to a command. And we observe similar effects in the operation of appetite and passion in man: for these, although by their own tendency they move according to the affections of sense, yet, in that they owe obedience to reason, they are on occasion diverted from their proper tendency, as is shown in the first book of the *Ethics*.

§ 19. Wherefore, although by its simple nature earth draws to the centre equally, as was stated in the argument of our opponent's objection (§ 16 init.), yet there is besides this a nature of a certain kind, by which earth

parte, naturae universali obediens, ut mixtio sit possibilis; et secundum haec salvatur concentricitas terrae et aquae; et nihil sequitur impossibile apud recte philosophantes; ut patet in ista figura, ut sit coelum circulus in quo A, aqua circulus in quo B, terra circulus in quo C; nec refert, quantum ad propositum, utrum aqua



parum vel multum a terra distare videatur. Et sciendum quod ista est vera, quia est qualis est forma et situs duorum elementorum; aliae duae superiores falsae; et positae sunt, non quia sic sit, sed ut sentiat discens, ut ille dicit in primo *Priorum*. Et quod terra emergat per gibbum et non per centralem circumferentiam, indubitabiliter patet, considerata figura terrae emergentis. Nam figura terrae emergentis est figura semilunii; qualis nullo modo esse posset, si emergeretur secundum circumferentiam regularem sive centralem; nam, ut

l. 7. E *verum* pro *utrum*.

submits to elevation in some part of itself, and thus becomes obedient to universal nature, in order that mixture may be possible. In this way the principle of the concentricity of earth and water is saved: and there is nothing in the conclusion which to those who study philosophy correctly is impossible: as the figure here given shows.

A = Sphere of Heaven
B = Sphere of Water
C = Sphere of Earth

It does not affect the truth of this proposition, whether the distance between the water and the earth be great or small.

And take notice that this is a true figure, for it represents the actual shape and position of the two elements. The two former figures were false: and they were given, not to show the true state of things, but for the instruction of the student: see *Prior Analytics*, i.[a]

Now if we consider the shape of the upraised or elevated land, it will be clear beyond all doubt, that it is a protuberance and not a portion of the circumference described about the centre of the earth. For the shape is that of a half moon: and this it could not possibly be, if it rose above the surface in the shape of its

[a] *Anal. Prior*, i. 41.

demonstratum est in theorematibus mathematicis, necesse est circumferentiam regularem sphaerae a superficie plana sive sphaerica, qualem oportet esse superficiem aquae, emergere semper cum horizonte circulari. Et quod terra emergens habeat figuram qualis est semilunii, patet et per naturales de ipsa tractantes, et per astrologos climata describentes, et per cosmographos regiones terrae per omnes plagas ponentes. Nam, ut communiter ab omnibus habetur, haec habitabilis extenditur per lineam longitudinis a Gadibus, quae supra terminos occidentales ab Hercule ponitur, usque ad ostia fluminis Ganges, ut scribit Orosius. Quae quidem longitudo tanta est, ut occidente Sole in aequinoctiali existente illis qui sunt in altero terminorum, oritur illis qui sunt in altero, sicut per eclipsim Lunae compertum est ab astrologis. Igitur oportet terminos praedictae longitudinis distare per CLXXX gradus, quae est dimidia distantia totius circumferentiae. Per lineam vero latitudinis, ut communiter habemus ab eisdem, extenditur ab illis quorum zenith est circulus aequinoctialis, usque ad illos quorum

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l. 7. E *ut patet.* l. 8. E *& climata.*

regular centrical circumference: for, as mathematical theorems prove, the regular circumference of a sphere, if raised out of a plane surface or out of a spherical surface, such as the surface of water must necessarily be, will always stand above it with a circular horizon. And that the shape of the upraised land is that of a half moon is clear, from the method in which naturalists treat of it, in which astronomers describe the climatic belts, and in which cosmographers arrange the regions of the earth through all the zones. For, as is universally held, this our habitable quarter extends in a line of longitude from Gades, founded by Hercules at the western limit, to the mouths of the river Ganges, as Orosius writes.[a] And this longitude is such that when at the equinox the sun sets to the people at one extremity it rises to the people at the other, as astronomers have learnt from observing the eclipses of the moon. Therefore the extremities of the said line of longitude must be one hundred and eighty degrees apart, being half the distance of the whole circumference. Again, as we find the same authorities agree in holding, our habitable quarter extends in a line of latitude from those people whose zenith is the equatorial circle to those whose

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[a] Orosius, *Adversus Paganos*, i. 2. 7, 13.

zenith est circulus descriptus a polo zodiaci circa polum mundi, qui quidem distat a polo mundi circiter XXIII gradus; et sic extensio latitudinis est quasi LXVII graduum, et non ultra, ut patet intuenti. Et sic patet, quod terram emergentem oportet habere figuram semilunii, vel quasi; quia illa figura resultat ex tanta latitudine et longitudine, ut patet. Si vero haberet horizontem circularem, haberet figuram circularem cum convexo; et sic longitudo et latitudo non differrent in distantia terminorum; sicut manifestum esse potest etiam mulieribus. Et sic patet de tertio proposito in ordine dicendorum.

§ 20. Restat nunc videre de causa finali et efficiente huius elevationis terrae, quae demonstrata est sufficienter; et hic est ordo artificialis; nam quaestio an est debet praecedere quaestionem propter quid est. Et de causa finali sufficiant quae dicta sunt in praemediata distinctione. Propter causam vero efficientem investigandam, praenotandum est, quod tractatus praesens non

l. 2. E *qd quid.* l. 11. E om. *non.*

l. 19. Arist. *Anal. Post.* ii. 7.
l. 20. *praemediata.* Cf. *De Vulg. El.* II. xiii. 60.

zenith is a circle drawn from the pole of the zodiac round the pole of the world, at a distance of about twenty-three degrees from the pole of the world: and thus its extension in latitude is about sixty-seven degrees and no more, as is clear when we consider it. It is therefore evident, that the upraised land ought to have the shape of a half moon or nearly so, that being the figure resulting from the given breadth and length. If, on the contrary, it had a circular horizon, its shape would be circular and convex, and there would be no difference in the extremes of its length and breadth: as may be clear even to women. We have now *dealt with the objections brought forward against our conclusions*: *and have* established the third in order of the matters we had undertaken to speak of (§ 9).

§ 20. It now remains to examine into the final and efficient cause of the elevation of the earth, already sufficiently established: and here the order is technical: for the question whether a thing is so should precede the question why it is so. Of the final cause enough has been said in the previous discussion. We may therefore now proceed to the examination of the efficient cause: and here we must take note that the inquiry is one within the limits of

est extra materiam naturalem, quia inter ens mobile, scilicet aquam et terram, quae sunt corpora naturalia; et propter haec quaerenda est certitudo secundum materiam naturalem, quae est hic materia subiecta; nam circa unumquodque genus in tantum certitudo quaerenda est, in quantum natura rei recipit, ut patet ex primo *Ethicorum*. Quum igitur innata sit nobis via investigandae veritatis circa naturalia ex notioribus nobis, naturae vero minus notis, in certiora naturae et notiora, ut patet ex primo *Physicorum*; et notiores sint nobis in talibus effectus quam causae (quia per ipsos ducimur in cognitionem causarum, ut patet; quia eclipsis solis duxit in cognitionem interpositionis lunae; unde propter admirari coepere philosophari), viam inquisitionis in naturalibus

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l. 10. E *vobis*. l. 11. E *incertiora*. l. 13. E omits *ipsos*, and reads *quia per inducimur*.

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l. 3. *quaerenda est*. Λέγοιτο δ' ἂν ἱκανῶς εἰ κατὰ τὴν ὑποκειμένην ὕλην διασαφηθείη, *Eth. Nic.* i. 3, § 1. Cf. *De Mon.* II. ii. 62 'Philosophus docet in primis ad Nicomachum: Non similiter in omni materia certitudo quaerenda est, sed secundum quod natura rei subiectae recipit'.

l. 8. *Ethicorum*. Arist. *Eth. Nic.* i. 3, § 4.

Quum igitur: cf. *Conv.* II. i. 107–14: 'Onde,

natural matter, being concerned with something moveable, viz. water and earth, which are natural bodies: and therefore we must only expect that degree of certainty which is to be found in natural matter, such as the subject matter here is: for in every kind of inquiry certainty is only to be looked for so far as the nature of the matter admits of it: so Aristotle shows in the first book of the *Ethics*.

Seeing therefore that for us the path of investigation in things natural must be from what is better known to us and less known to nature to what is more certain to nature and better known, as is shown in the first book of the *Physics*: and seeing also that in such matters effects are better known to us than causes, (for it is by them that we are led to the knowledge of causes: and so the solar eclipse has brought us to the knowledge of the interposition of the moon, and it is in wonder that philosophy began:) the path of inquiry in

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siccome dice il Filosofo nel primo della Fisica, la natura vuole che ordinatamente si proceda nella nostra conoscenza, cioè procedendo da quello che conoscemo meglio, in quello che conoscemo non così bene. Dico che la natura vuole, in quanto questa via di conoscere è in noi naturalmente innata.' Arist. *Phys.* i, § 1 *πέφυκε δὲ ἐκ τῶν γνωριμωτέρων ἡμῖν ἡ ὁδὸς καὶ σαφεστέρων ἐπὶ τὰ σαφέστερα τῇ φύσει καὶ γνωριμώτερα.*

oportet esse ab effectibus ad causas; quae quidem via, licet habeat certitudinem sufficientem, non tamen habet tantam, quantam habet via inquisitionis in mathematicis, quae est a causis, sive a superioribus, ad effectus, sive ad inferiora; et ideo quaerenda est illa certitudo, quae sic demonstrando haberi potest. Dico igitur, quod causa huius elevationis efficiens non potest esse terra ipsa; quia quum elevari sit quoddam ferri sursum; et ferri sursum sit contra naturam terrae; et nihil, per se loquendo, possit esse causa eius quod est contra suam naturam; relinquitur, quod terra huius elevationis efficiens causa esse non possit. Et similiter etiam neque aqua esse potest; quia quum aqua sit corpus homogeneum, in qualibet sui parte, per se loquendo, uniformiter oportet esse virtutem; et sic non esset ratio quare magis elevasset hic quam alibi. Haec eadem ratio removet ab hac causalitate aërem et ignem; et quum non restet ulterius nisi coelum, reducendus est hic effectus in ipsum, tanquam in causam propriam. Sed quum sint plures

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l. 3. E *non tantum.* l. 18. E *ꝙa.* l. 20. E *restat.*

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l. 17. *virtutem.* Mr. E. Poste has suggested *virtuatam*: see below, § 21, l. 6.

things natural must be from effects to causes. And this path, though it may have adequate certainty, has not yet as great certainty as the path of inquiry has in mathematics: for that is from causes, which are the higher, to effects, which are the lower: so that we must expect only such degree of certainty as can be obtained from this manner of proof.

I say then that the efficient cause of the elevation of the earth cannot be the earth itself: for elevation is a kind of movement upwards, and to move upward is against the nature of earth: and nothing, spoken of as in itself, can be the cause of what is against its own nature: whence it follows that earth cannot be the efficient cause of this elevation. Likewise also, neither can water be the cause: for water being a homogeneous body, its virtue, speaking of it as in itself, must exist uniformly in every part of it: and so there would be no reason why it should have elevated *the earth* more here than elsewhere. The same reasoning takes away from this source of causation both air and fire: and as nothing else remains but the heavens, it is to them that the effect must be referred as its proper cause.

Now, there being many heavens, it still

coeli, adhuc restat inquirere in quod, tanquam in propriam causam, habeat reduci. Non in coelum lunae; quia quum organum suae virtutis sive influentiae sit ipsa luna; et ipsa tantum declinet per zodiacum ab aequinoctiali versus polum antarcticum, quantum versus arcticum, ita elevasset ultra aequinoctialem, sicut citra; quod non est factum. Nec valet dicere quod illa declinatio non potuit esse propter magis appropinquare terrae per excentricitatem; quia si haec virtus elevandi fuisset in luna (quum agentia propinquiora virtuosius operentur), magis elevasset ibi quam hic.

§ 21. Haec eadem ratio removet ab huiusmodi causalitate omnes orbes planetarum; et quum primum mobile, scilicet sphaera nona, sit uniforme per totum, et per consequens uniformiter per totum virtuatum, non est ratio quare magis ab ista parte quam ab alia elevasset. Quum igitur non sint plura corpora mobilia, praeter coelum stellatum, quod est octava

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l. 1. E *adhec.* l. 8. E *valent.* l. 18. E q̃ pro *quare.* l. 19. E q̃ pro *quam.*

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l. 13. See Appendix, p. 73.

l. 20. *mobilia* : κινητικά.

l. 21. *coelum stellatum* : cf. *Par.* ii. 136.

remains to inquire to which of them, as to its proper cause, the effect has to be referred. Not to the heaven of the moon: for the moon being itself the organ of its own power or influence, and itself declining along the zodiac from the equator as far in the direction of the Antarctic pole as in the direction of the Arctic, it would elevate the earth as much on the other side of the equator as it does on this side: which is not the case. And it does not avail to say that such a declination is impossible for the reason that the excentricity of the moon's orbit brings it nearer to the earth: for, if the moon had possessed the power of causing elevation, then, as the operative force of active bodies is greater the nearer they are, it would have elevated the earth more on that side than on this.

§ 21. The same reasoning removes from this kind of causation all the planetary orbs: and as the *primum mobile*, which is the ninth sphere, is uniform throughout and consequently possesses uniform virtue throughout, there is no reason why it should have elevated the earth more in one part than in another. Whence it follows, that as there are no more bodies causing motion except the heaven of the fixed stars, namely the

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'Così l' intelligenza sua bontate
Multiplicata per le stelle spiega,
Girando sè sopra sua unitate.'

sphaera, necesse est hunc effectum in ipsum reduci. Ad cuius evidentiam sciendum, quod licet coelum stellatum habeat unitatem in substantia, habet tamen multiplicitatem in virtute; propter quod oportuit habere diversitatem illam in partibus quam videmus, ut per organa diversa virtutes diversas influeret; et qui haec non advertit, extra limitem philosophiae se esse cognoscat. Videmus in eo differentiam in magnitudine stellarum et in luce, in figuris et imaginibus constellationum; quae quidem differentiae frustra esse non possunt, ut manifestissimum esse debet omnibus in philosophia nutritis. Unde alia est virtus huius stellae et illius, et alia huius constellationis et illius; et alia virtus stellarum quae sunt citra aequinoctialem, et alia earum quae sunt ultra. Unde quum vultus inferiores sint similes vultibus superioribus (ut Ptolemaeus dicit), consequens est, quod quum iste effectus non possit reduci nisi in coelum stellatum, ut visum est, quod similitudo virtualis agentis consistat in illa regione coeli quae operit hanc terram detectam. Et quum ista terra detecta extendatur a linea aequinoctiali usque

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l. 1. E *non* pro *in*. l. 16. E *circa*.

eighth sphere, this effect must necessarily be referred to that heaven. And to make this clear, we must understand that, although the heaven of the stars has unity in substance, it has nevertheless multiplicity in virtue: and on this account it must have that diversity of parts which we see it have, in order that by diverse organs it may inspire diverse operations. Not to observe this is to be outside the pale of philosophy.

In the heaven of the stars, we see differences in their size, and in their light, and in the shapes and semblances of the constellations: and these differences cannot be without a purpose, as ought to be absolutely clear to all who have been nurtured in philosophy. Hence it is, that there is one kind of virtue in this star and another in that: one in this constellation and another in that: one in the stars on this side of the equator and another in those on the other side. Wherefore, since the aspects below resemble the aspects above, as Ptolemy observes, it follows that, since the effects we are dealing with cannot be referred to any other cause than the heaven of the stars, as we have seen, the likeness of the operative agent is to be found in that region of the heaven which covers this exposed land. And, as this exposed land extends from the equator as far as the line described by

ad lineam quam describit polus zodiaci circa polum mundi, ut superius dictum est; manifestum est, quod virtus elevans est illis stellis quae sunt in regione coeli istis duobus circulis contenta, sive elevet per modum attractionis, ut magnes attrahit ferrum, sive per modum pulsionis, generando vapores pellentes, ut in particularibus montuositatibus. Sed nunc quaeritur: Quum illa regio coeli circulariter feratur, quare illa elevatio non fuit circularis; et respondeo quod ideo non fuit circularis, quia materia non sufficiebat ad tantam elevationem. Sed tunc arguetur magis, et quaeritur: Quare potius elevatio hemisphaerialis fuit ab ista parte quam ab alia; et ad hoc est dicendum, sicut dicit Philosophus in secundo *de Coelo*, quum quaerit quare coelum movetur ab oriente in occidentem et non e converso; ibi enim dicit, quod consimiles quaestiones vel a multa stultitia vel a multa praesumptione procedunt, propterea quod sunt supra intellectum nostrum. Et ideo dicendum ad hanc quaestionem, quod ille dispensator Deus gloriosus, qui dispensavit de situ polorum, de situ centri mundi, de distantia ultimae circumferentiae universi a centro eius, et de aliis

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l. 17. E *occidens*. l. 20. E *que sunt*.

the pole of the zodiac round the pole of the world, as stated above, it is manifest that the virtue of elevating belongs to those stars which are in the region of the heavens contained within those two circles, whether it causes elevation by way of attraction, as a magnet draws iron, or by way of expulsion, by generating explosive vapours, as in particular mountain regions.

But now the question is asked: Seeing that this region of the heavens moves round in a circle, why was this elevation not circular? I answer, because there was not matter enough for so much elevation. Then there arises further argument, and we are asked: Why was this hemispherical elevation in this region and not in some other? To which we must reply, as Aristotle does in the second book *De Caelo*, when he inquires why the heavens move from east to west, and not in the converse direction: for he says there, that questions like these proceed either from great folly or from great presumption, because they are beyond our intelligence. And so to this question we must answer that God, the glorious disposer, who has ordered the position of the poles, the position of the centre of the world, the distance of the extreme circumference of the universe from its

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l. 16. *de Caelo*: Arist. ii. 5. Cf. *Purg.* iii. 34 ff.

consimilibus, haec fecit tamquam melius sicut et illa. Unde quum dixit: 'Congregentur aquae in locum unum, et appareat arida,' simul et virtuatum est coelum ad agendum, et terra potentiata ad patiendum.

§ 22. Desinant ergo, desinant homines quaerere quae supra eos sunt, et quaerant usque quo possunt, ut trahant se ad immortalia et divina pro posse, ac maiora se relinquant. Audiant amicum Iob dicentem: 'Numquid vestigia Dei comprehendes, et Omnipotentem usque ad perfectionem reperies?' Audiant Psalmistam dicentem: 'Mirabilis facta est scientia tua ex me: confortata est, et non potero ad eam.' Audiant Isaiam dicentem: 'Quam distant coeli a terra, tantum distant viae meae a viis vestris.' Loquebatur equidem

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l. 14. E *scientia tua. Ex me confortata est.*

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l. 8. *trahant se*: cf. *Conv.* IV. xiii. 71: 'l' uomo si dee trarre alle divine cose quanto può': where, as pointed out by Dr. Moore (*Studies*, i. 105; ii. 351), the expression 'se trahere' is from Aquinas, and does not occur either in Aristotle or in the *Antiqua Translatio.*

ad immortalia. As a comparison with *Conv.* IV. xiii. 71 proves, Dante had before him the passage in *Nic. Eth.* x. 7. 8: but it must be observed that he is not here reproducing the exact spirit of that passage.

centre, and other like matters, has wrought this also for the best, even as those. Wherefore, when He said, 'Let the waters be gathered together into one place and let the dry land appear,' then at the same moment the heaven was endued with power to act and the earth with capacity to be acted upon.

§ 22. Wherefore let men cease, let them cease to search into things which are too high for them, and let them search as far only as they can, that they may draw near to things immortal and divine to the measure of their power, and leave alone the things which are greater than they. Let them listen to Job's friend saying, 'Canst thou by searching find out God? canst thou find the Almighty unto perfection?' Let them listen to the Psalmist saying, 'Such knowledge is too wonderful and excellent for me: I cannot attain unto it.' Let them listen to Isaiah saying, 'As the heavens are higher than the earth, so are my ways higher than your ways': for he was speaking in the

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Aristotle says we are to aim at being immortal as far as possible and not to be deterred by those who tell us that immortality is not for mortals. Aristotle makes no reservation or qualification against aiming too high, as Dante does here, *maiora se relinquere*; indeed, the spirit of the whole passage is rather the opposite.

in persona Dei ad hominem. Audiant vocem Apostoli ad Romanos: 'O altitudo divitiarum scientiae et sapientiae Dei! quam incomprehensibilia iudicia eius, et investigabiles viae eius!' Et denique audiant propriam Creatoris vocem dicentis: 'Quo ego vado, vos non potestis venire.' Et haec sufficiant ad inquisitionem intentae veritatis.

§ 23. His visis, facile est solvere ad argumenta quae superius contra fiebant; quod quidem quinto proponebatur faciendum. Quum igitur dicebatur: Duarum circumferentiarum inaequaliter a se distantium impossibile est idem esse centrum; dico quod verum est, si circumferentiae sunt regulares sine gibbo vel gibbis. Et quum dicitur in minori quod circumferentia aquae et circumferentia terrae sunt huiusmodi, dico quod non est verum, nisi per gibbum qui est in terra; et ideo ratio non procedit. Ad secundum, quum dicebatur: Nobiliori corpori debetur nobilior locus, dico quod verum est secundum propriam naturam; et concedo minorem; sed quum concluditur quod ideo aqua

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l. 11. E *quanto.* l. 14. E om. *est.*

person of God to man. Let them listen to the voice of the Apostle to the Romans, 'Oh! the depth of the riches of the wisdom and knowledge of God! how unsearchable are his judgements, and his ways past finding out.' Lastly, let them listen to the very voice of the Creator, saying, 'Whither I go, ye cannot come.' And let this suffice for the inquiry into the truth we have undertaken.

§ 23. After this review, it is easy to refute the arguments to the contrary which were produced at the opening of the treatise: and this was the fifth of the matters that we undertook.

To the statement that two circumferences unequally distant cannot have the same centre, I answer that it is true only when the circumferences are both regular without any protuberance or protuberances. And when in the minor premiss it was stated that the circumferences of earth and water are unequally distant, I answer that it is not true, except so far as relates to the protuberance on the earth: and therefore the reasoning fails. In reply to the second argument, where it was stated that the nobler body ought to have the nobler place, I say that this is only true as regards their own natures: and I allow the minor premiss: but when the conclusion is drawn that therefore

debet esse in altiori loco, dico quod verum est secundum propriam naturam utriusque corporis; sed per supereminentem causam (ut superius dictum est) accidit in hac parte terram esse superiorem; et sic ratio deficiebat in prima propositione. Ad tertium, quum dicitur: Omnis opinio quae contradicit sensui est mala opinio, dico quod ista ratio procedit ex falsa imaginatione. Imaginantur enim nautae, quod ideo non videant terram in pelago existentes de navi, quia mare sit altius quam ipsa terra; sed hoc non est; immo esset contrarium, magis enim viderent. Sed est hoc quia frangitur radius rectus rei visibilis inter rem et oculum a convexo aquae; nam quum aquam formam rotundam habere oporteat ubique circa centrum, necesse est in aliqua distantia ipsam efficere obstantiam alicuius convexi. Ad quartum, quum arguebatur: Si terra non esset inferior

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l. 3. E om. *per.* l. 7. E *contrahit.* l. 8. E *fala.* l. 11. E *artius.*

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l. 12. *magis enim viderent*: because, if there were no curvature in the water, the line of sight would be shorter: and the higher the eye is raised above objects on the level the less is it able to realize their height. This is demonstrated by Sacrobosco, *Sphaera*, ed. Lugd. 1567, pp. 21, 22. See also Roger Bacon, *Op. Maj.* pt.

water ought to be in the higher place, I say that this is true as regards the proper nature of the two bodies: but that in fact from causes overriding this, as was said above, earth happens to have in this, *the habitable quarter*, the upper place: and this is what was amiss in the first proposition. In reply to the third argument, where it is stated that every opinion which contradicts observation is a wrong opinion, I say that the reasoning is founded on a fallacy of the imagination. For seamen imagine that the reason why when they are on the water they do not see land from the deck is that the sea is higher than the land: but this is not so, but rather the contrary, for they would see it better. But the true reason *why they do not see the mountains till they get to the mast-head* is because the straight line drawn to the visible object is broken between the eye and the object by the convexity of the water: for the shape of water about its centre being necessarily round everywhere, it must at a certain distance interpose a part of its convex surface. In reply to the fourth argument, where it was contended that, if earth were not lower than the water, there would be no springs and so

iv. c. 10: 'Relinquitur quod aliquid impedit visum illius qui est in navi. Sed nihil potest esse nisi tumor sphaericus aquae.'

etc.; dico quod illa ratio fundatur in falso; et ideo nihil est. Credunt enim vulgares et physicorum documentorum ignari, quod aqua ascendat ad cacumina montium, et etiam ad locum fontium in forma aquae; sed istud est valde puerile, nam aquae generantur ibi (ut per Philosophum patet in *Meteoris* suis), ascendente materia in forma vaporis. Ad quintum, quum dicitur quod aqua est corpus imitabile orbis lunae, et per hoc concluditur quod debeat esse excentrica, quum orbis lunae sit excentricus; dico quod ista ratio non habet necessitatem; quia licet unum adimitetur aliud in uno, non propter hoc est necesse quod imitetur in omnibus. Videmus ignem imitari circulationem coeli, et tamen non imitatur ipsum in non moveri recte, nec in non habere contrarium suae qualitati; et ideo ratio non procedit. Et sic ad argumenta.

Sic igitur determinatur determinatio et tractatus de forma et situ duorum elementorum, ut superius propositum fuit.

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l. 7. E *Methauris.* l. 12. E *habeat.*

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l. 8. *in forma vaporis.* Cf. *Purg.* v. 109:

'Ben sai come nell' aere si raccoglie
Quell' umido vapor che in acqua riede';

forth, I say that the reasoning is based on a mistake and so is of no validity. It is only common people ignorant of physics who believe water to rise to the tops of mountains and to the sources of springs in the form of water. This notion is utterly childish, for, as Aristotle has shown in the *Meteora*, water is generated there out of matter which has been carried to the summit in the form of vapour. In reply to the fifth argument, where it is stated that water is a body which imitates the orbit of the moon, and that as the moon's orbit is excentric we must infer that water is excentric, I say that the reasoning is not conclusive: for allowing that one body imitates another in one particular, it need not therefore imitate it in all. For example, fire imitates the circulation of the heaven; but yet it does not imitate the heaven in moving otherwise than in a straight line, nor in having nothing contrary to itself: and therefore the analogy does not hold. These are our replies to the arguments produced.

Thus then do we sum up the case and bring the examination of the form and position of the two elements to its final conclusion, as we undertook at the beginning.

And again xxviii. 121: 'vena
Che ristori vapor che giel converta.'

l. 14. *in omnibus*: Arist. *Meteor.* i. 9.

§ 24. Determinata est haec philosophia dominante invicto Domino, domino Kane Grandi de Scala pro Imperio sacrosancto Romano, per me Dantem Alagherium, philosophorum minimum, in inclyta urbe Verona, in sacello Helenae gloriosae, coram universo clero Veronensi, praeter quosdam qui, nimia caritate ardentes, aliorum rogamina non admittunt, et per humilitatis virtutem Spiritus Sancti pauperes, ne aliorum excellentiam probare videantur, sermonibus eorum interesse refugiunt. Et hoc factum est in anno a nativitate Domini nostri Iesu Christi millesimo trecentesimo vigesimo, in die Solis, quem praefatus noster Salvator per gloriosam suam nativitatem, ac per admirabilem suam resurrectionem nobis innuit venerandum; qui

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l. 2. E *cane*.

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l. 7. *nimia caritate ardentes*: cf. *De Mon.* III. iii. 67: 'sperantes caritate arserunt et ardentes ei coheredes factos esse mundus non dubitat.'

l. 14. *per gloriosam suam nativitatem.* 'Dignitas dominicae diei notatur in hoc quod fuit prima dierum. . . . Item in ea Christus natus est. Item Christus in ea resurrexit,' *Compend. Theol. veritatis*, lib. 2. c. 10.

§ 24. This philosophical question was decided under the lordship of the unconquered Lord Can Grande della Scala, Vicar of the Holy Roman Empire, by me Dante Alighieri, of philosophers the least, in the noble city of Verona, in the Chapel of the blessed Saint Helena, before all the clergy of Verona, certain only excepted, who burning with excess of charity, refuse the invitations of any but themselves, and, having through the virtue of humility become the poor of the Holy Spirit, abstain from being present at the discourses of others, and thereby escape from seeming to admit their excellence.

And this was accomplished in the year of the Nativity of our Lord Jesus Christ one thousand three hundred and twenty, on Sunday, being the day which our Saviour afore-named directed to be venerated for his glorious birth and for his marvellous resurrection : which said

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A widely popular work, of doubtful authorship, but long attributed to St. Bonaventura. (*Opera St. Bonav.* Romae, 1596, vol. vii, p. 752.)

l. 16. *qui quidem dies*. In this identification of the day on which the *Quaestio* was read at Verona, two calculations are made : in the first the day is reckoned forward, according to our modern practice ; it was

quidem dies fuit septimus a Ianuariis idibus, et decimus tertius ante kalendas Februarias.

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a sennight from the Ides; in the second, it is reckoned backward, according to Latin usage, and both days are counted, the day itself and the day to which the

day was the seventh after the Ides of January and the thirteenth before the Kalends of February.

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reckoning extends. Signor Biagi discovers a Dantesque fancy in the introduction of the number seven.

APPENDIX

Note on § 20, ll. 56–71.

Dr. Moore (*Studies*, ii, p. 339) supposes Dante to be following the view expressed by Alfraganus (c. xviii & sqq.) 'Eccentrici Lunae planum . . . a zodiaci plano deflectit ad septentrionem et austrum declinatione rata et immutabili'. This refers to the declination of the moon's orbit from the plane of the zodiac, not from that of the equator: but Dante is speaking of a declination from the equator measured along the zodiac ('per zodiacum'). The declination from the plane of the zodiac is not referred to at all, and would not be relevant to the argument: nor is it likely that Dante misread Alfraganus, whose statement is clear and precise.

Mr. Wicksteed has suggested that in l. 66 'elevatio' should be substituted for 'declinatio': and in that case the objection expressed by 'non valet dicere', &c., would be, that the higher elevation of the land in the northern hemisphere is accounted for by the fact that the moon, by reason of its orbit being excentric, would come nearer to that part of the earth than to any other. But to give this meaning, the word 'non' will have to be omitted.

If 'illa declinatio' (the reading of the Editio Princeps) is retained, it will refer to the equal declination of the moon, stated above, from the equator to the north and south poles: and the objection which Dante has to meet is that, though the angular declination of the moon from the equator was the same at

the two extreme points contemplated, yet the actual distance of the moon from the plane of the equator was not the same, because owing to the excentricity of its orbit it would come nearer to the earth than elsewhere. Dante's reply to the objection is this: it is true that the distance is not the same, but the difference tells the other way: the moon does by reason of the excentricity of its orbit come nearer to the earth on one side than on the other: but this happens when it is on the south side of the plane of the equator, and not on the north: so that if it had any effect, it would be to elevate the land in the southern hemisphere more than in the northern.

There remains the difficulty of finding authority for the belief that the moon approaches nearer to the earth in the southern hemisphere than in the north; and so far, no explanation has yet been offered: but this belief is in no way an anticipation of modern astronomical knowledge, and its occurrence in a treatise professedly of the fourteenth century does not affect the question of genuineness.

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